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EXAMINER
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BEFORE THE PATENT TRIAL AND APPEAL BOARD

Ex parte MATTHEW J. MEMMOTT, ALEXANDER W. HARKNESS, AND WILLIAM EDWARD CUMMINS

Appeal 2015-007179
Application 13/495,069
Technology Center 3600

Before MICHAEL L. HOELTER, BRETT C. MARTIN, and ERIC C. JESCHKE, *Administrative Patent Judges*.

JESCHKE, *Administrative Patent Judge*.

DECISION ON APPEAL

STATEMENT OF THE CASE

Matthew J. Memmott et al. ("Appellants") seek review under 35 U.S.C. § 134(a) of the Examiner's decision, as set forth in the Final Office Action dated January 9, 2015 ("Final Act."), and as further explained in the Advisory Action dated March 5, 2015 ("Adv. Act."), rejecting claims 1–11 and 13–15.[1] Claim 12 has been canceled. We have jurisdiction under 35 U.S.C. § 6(b).

We REVERSE.

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[1] Appellants identify Westinghouse Electric Company LLC as the real party in interest. Appeal Br. 2.

BACKGROUND

The disclosed subject matter "pertains generally to small modular pressurized water reactors and more particularly to a combined core makeup tank and heat removal system for such a reactor." Spec. ¶ 2. Claim 1, the sole independent claim, is reproduced below, with emphasis added:

> 1. A modular pressurized water reactor having a primary circuit including a reactive core, an upper internals, a steam generator heat exchanger and pressurizer housed within a reactor pressure vessel which is enclosed within a substantially close fitting containment, including a primary coolant hot leg between a coolant flow exit from the core and an upstream side of the steam generator heat exchanger and a coolant cold leg between a downstream side of the steam generator heat exchanger and a coolant flow entrance to the core, the hot leg and cold leg being housed within the reactor pressure vessel, the modular pressurized water reactor further including a combined passive heat removal system and high-head water injection system comprising:
>
> a core makeup tank including:
>
> a heat exchange assembly supported within the core makeup tank, the heat exchange assembly having a primary side and a secondary side, the primary side having an interior flow path within the heat exchange assembly with a primary side inlet and a primary side outlet, the interior flow path being maintained at a pressure at least equal to a pressure within the reactive core;
>
> a primary side inlet plenum that is in fluid communication with the inlet of the interior flow path of the heat exchange assembly and the hot leg exiting the core;

> a primary side outlet plenum that is in fluid communication with the outlet of the interior flow path of the heat exchange assembly and the cold leg between the downstream side of the steam generator heat exchanger and the coolant flow entrance to the core; and
>
> a secondary side plenum within the secondary side of the heat exchange assembly having an inlet end and an outlet end and a secondary side flow path over an exterior of the heat exchange assembly interior flow path, connecting the inlet end to the outlet end of the secondary side plenum;
>
> *an ultimate heat sink heat exchanger is connected to the core makeup tank between the inlet end and the outlet end of the secondary side plenum, wherein the secondary side plenum and a connection with the ultimate heat sink heat exchanger is pressurized to an extent to prevent boiling under accident conditions*; and
>
> means for isolating the primary side of the heat exchange assembly from the core.

REJECTIONS[2]

1. Claims 1–11 and 13–15 stand rejected under 35 U.S.C. § 103(a) as unpatentable over Conway (US 4,753,771, issued June 28, 1988), Gardner

[2] The Examiner rejected claims 1–11 and 13–15 (1) under 35 U.S.C. § 103(a) as unpatentable over Conway and Gardner and (2) under 35 U.S.C. § 102(a) as anticipated by, or, in the alternative, under 35 U.S.C. § 103(a) as unpatentable over Gardner. *See* Final Act. 5–8, 13–17. In the Answer dated July 23, 2015, the Examiner withdraws these rejections. *See* Ans. 4.

(US 5,102,616, issued Apr. 7, 1992), and Spinks (US 5,217,682, issued June 8, 1993). *See* Final Act. 8–13; Ans. 2–6.[3]

2. Claims 1–11 and 13–15 stand rejected under 35 U.S.C. § 103(a) as unpatentable over Gardner and Spinks. *See* Ans. 6–11.[4]

DISCUSSION

Claim 1 recites, among other limitations,

> an ultimate heat sink heat exchanger is connected to the core makeup tank between the inlet end and the outlet end of the secondary side plenum, wherein the secondary side plenum and a connection with the ultimate heat sink heat exchanger is pressurized to an extent to prevent boiling under accident conditions.

Appeal Br. 13 (Claims App.).

For both Rejections 1 and 2, the Examiner relied on Gardner for the structure in the limitation at issue, (1) identifying element 62 as the "ultimate heat sink heat exchanger," (2) identifying element 58 as the "core makeup tank," and (3) implicitly identifying element 60 as the "secondary side plenum" with an "inlet end" and "outlet end" and elements 64 and 66 as the "connection with the ultimate heat sink heat exchanger." *See* Final Act. 9 (citing Gardner, col. 10, ll. 12–19) (Rejection 1); Ans. 7 (Rejection 2); *see* Gardner, Fig. 1 (showing these elements).

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[3] The Examiner filed two Answers: one dated July 23, 2015 and another dated August 4, 2015, which appear to be substantively the same (but with different page numbering). We will cite to the version dated July 23, 2015, using "Ans."

[4] The Examiner added this Rejection as a new ground in the Answer dated July 23, 2015.

The Examiner stated that "Gardner is silent as to the pressure within the secondary loop of the passive cooling system [(]defined by 60, 62, 66, 64)" but found that "Spinks teaches a passive residual heat removal system wherein the secondary side plenum and a connection with the ultimate heat sink heat exchanger is pressurized to an extent to prevent boiling [(]column 4, line 56 through column 5, line 8)." Final Act. 10 (Rejection 1); *see also* Ans. 7–8 (Rejection 2) (similar findings). According to the Examiner:

> Combining the pressurized passive decay heat system coolant loop of Spinks with the combined passive heat removal system and core makeup tank of Gardner offers the predictable advantage of providing a system that contains a "fairly large mass of fluid" in the decay heat removal loop ([Spinks], column 4, lines 53–55), which one of ordinary skill in the art at the time of the invention would have recognized would allow the passive heat removal system of Gardner to more efficiently remove heat from the core make-up tank.

Final Act. 10 (Rejection 1); *see also* Ans. 7–8 (Rejection 2) (similar reasoning).

Appellants argue that the passage at column 4, line 56 to column 5, line 8 of Spinks, cited by the Examiner, "teaches that the secondary side of the decay heat removal heat exchanger is pressurized to an extent to prevent boiling during normal operation and shutdown" but that Spinks, at column 5, lines 9 to 25, "further teaches that the pressure in the secondary side is gauged to *permit boiling during an accident condition* where the steam generator is removed as a heat sink." Appeal Br. 9 (Rejection 1) (emphasis added); Reply Br. 3–4 (Rejection 2) (emphasis added).[5] We agree with this

[5] Appellants filed two Reply Briefs: one dated July 27, 2015 and another dated September 17, 2015. We will cite to the version dated July 27,

description of the teachings of Spinks. As noted by Appellants, however, the limitation at issue requires that these structures are "pressurized to an extent to *prevent boiling under accident conditions*." Appeal Br. 13 (Claims App.) (emphasis added).

The Examiner responds:

> In Spinks, boiling under accident conditions enables the activation of the passive heat removal loop in Spinks. However, Spinks is cited in the rejection as providing only the pressure within the secondary cooling loop (60/62/66/64) of Gardner. In Gardner, it is the breaking of vapor lock 78 that activates the passive cooling system of Gardner (column 13, line 19 through column 15, line 66) and the boiling under accident conditions of Spinks is not needed for operation in the combination. Such activation would occur regardless of the pressure within the secondary cooling loop (60/62/66/64) of Gardner.

Ans. 11–12.

Although the Examiner takes the position that the modified device does not "need[]" Spink's *contrary* feature of being pressurized in a manner to *allow* boiling under accident conditions (*id.*), that does not demonstrate that, in the modified device, the recited structures would satisfy the *required* feature of being "pressurized to an extent to *prevent* boiling under accident conditions." Appeal Br. 13 (Claims App.) (emphasis added). In other words, the Examiner has not shown support for the finding that "combining the pressurization of the cooling loop taught by Spinks with the system of Garner would prevent boiling of the coolant in the secondary loop under any conditions, including both normal operation and adverse/accident conditions within the primary loop." Final Act. 10 (Rejection 1); Ans. 8 (Rejection 2).

2015, and refer to that version as "Reply Br."

Moreover, Appellants correctly argue that the passage in Spinks relied on by the Examiner to support the reason to modify Gardner—Spinks, column 4, lines 53 to 55—"appears to be referring to the ultimate heat sink 55 and has no relevance" to pressurizing the secondary side. Reply Br. 5 (discussing Spinks, Fig. 3). Appellants also correctly argue that "the issue of a large mass [of fluid] does not in any manner suggest why you would want to pressurize the secondary side." *Id.* Thus, we agree that the passage identified does not provide sufficient reasoning with rational underpinning to support the legal conclusion of obviousness of claim 1. *See In re Kahn*, 441 F.3d 977, 988 (Fed. Cir. 2006), *cited with approval in KSR Int'l Co. v. Teleflex Inc.*, 550 U.S. 398, 418 (2007).

For these reasons, we do not sustain the rejection of claim 1 under either grounds set forth by the Examiner. We also do not sustain the rejection of claims 2–11 and 13–15, which depend from claim 1.

DECISION

We REVERSE the decision to reject claims 1–11 and 13–15 under 35 U.S.C. § 103(a) as unpatentable over Conway, Gardner, and Spinks, and (2) REVERSE the decision to reject claims 1–11 and 13–15 under 35 U.S.C. § 103(a) as unpatentable over Gardner and Spinks.

REVERSED